

# Investigating the Effects of Homoeopathic Medicines on Breast Cancer Cell Lines: A Narrative Review

<sup>1</sup>Dr. Puja Kalshetty

Designation : PG Scholar, Department of Homoeopathic Materia Medica,

Affiliation : Bharati Vidyapeeth (Deemed to be University) , Homoeopathic Medical college, Department of Post-graduate and Research centre, Pune

ORCID ID : <https://orcid.org/0000-0001-7282-2095>

<sup>\*2</sup>Dr. Poonam Rathi

Designation : Associate Professor , Department of Homoeopathic Materia Medica,

Affiliation : Bharati Vidyapeeth (Deemed to be University) , Homoeopathic Medical college, Department of Post-graduate and Research centre, Pune

ORCID ID : <https://orcid.org/0009-0005-4195-127X>

## Abstract:-

**Introduction :** Homoeopathy is system complementary and alternative medicine that is frequently used to help cancer patients feel better and lessen the side effects of traditional treatment. Conversely, there aren't many studies on using homoeopathic remedies to treat the illness itself. On the other hand, the utility of homoeopathic remedies to treat the illness itself has not been thoroughly researched. Nonetheless, research has been published suggesting that homoeopathic high dilutions may be beneficial in experimental cancer models.

**Objective :** The objective of this study was to perform narrative review on breast cancer cell lines in vitro research conducted till now.

**Methods :** A systemic search of literature on Homoeopathy and breast cancer was conducted by using electronic databases like google scholar, pubmed, researchgate.

**Conclusion :** Homoeopathic medicines have significant therapeutic potential for breast cancer treatment. This review highlights preliminary laboratory evidence that Homoeopathic medicines can be used as anticancer agent.

**Keywords:-** Homoeopathy, Cytotoxicity, Breast Cancer, in Vitro, Cell Line.

## I. INTRODUCTION

Breast cancer (BC) is the most common malignancy among women worldwide. It is now expected to overtake lung cancer as the most frequent type of cancer globally in 2020 with 2.3 million new cases, or 11.7% of all cancer cases, predicted. By 2030, epidemiological research indicates that there will be over 2 million cases of BC globally<sup>1</sup>. The risk of breast cancer has been linked to a number of factors. Age, sex, Western lifestyle, high-fat diet, and an increase in body mass index are the additional contributors. An elevated risk of breast cancer may also be linked to a prior benign breast biopsy history. Changes in cell shape and the presence of proliferation in the biopsy suggest to the danger<sup>2</sup>. The epithelial lining of the glandular tissue's ducts (85%) or lobules (15%) is where breast cancer first appears. Initially

contained ("in situ") within the duct or lobule, the malignant growth frequently shows no symptoms and has a minimal chance of metastasizing (spreading). At stage 0, these in situ cancers have the potential to grow over time and spread to neighbouring lymph nodes (regional 4 metastasis), other organs (distant metastasis), or the breast tissue directly surrounding them (invasive breast cancer). Women who die from breast cancer do so because of widespread metastases<sup>3</sup>. Exercise has been shown to be a successful, safe, and practical method for reducing side effects, avoiding complications, and lowering the risk of BC-specific mortality. Evidence supporting the cost-effectiveness of dietary and physical activity-related treatments for the primary prevention of BC was recently reviewed. Such alterations to one's way of life must be planned for in standard medical care<sup>1</sup>.

Dr. Samuel Hanhemann, a physician from Germany, developed homoeopathy as a alternative medical system in the 18th century. Even with the abundance of therapy choices available today, homoeopathy is still used in several nations, such as Germany, France, India, and the United Nations. Homoeopathy is a science that involves potentization and ultra high dilution. Currently, many studies have been carried out worldwide to isolate the active novel compounds from plants for cancer treatment. Homeopathy is the most holistic mode of treatment for breast cancer. Homeopathy as a system of therapeutics has shown remarkable results in many diseases. The earlier studies has shown anticancer activity of homeopathic remedies.

## II. METHODOLOGY

A systemic search of literature on Homoeopathy and breast cancer was conducted. For the literature search electronic database like Pubmed, Google scholar, researchgate was used. The search was done using keywords like Homoeopathy, breast cancer, Toxicity, In vitro studies, Anticancer. In this article only cell line studies were included. In vivo studies and unpublished articles are excluded from article.

### III. DISCUSSION

*Khartini Abdul Wahab et. al.* investigated MTT assay for cellular viability was used to determine the cytotoxic activity of the crude methanol extracts of *Gelsemium elegans* leaves. This study used two different types of human cancer cell lines, CaOV-3 (human ovarian cancer cells) and MDA-MB-231 (human oestrogen receptor negative breast cancer cells), to compare the toxicity of *G. elegans* against these two cancer cell lines. The results showed that *G. elegans* is potently cytotoxic against the human ovarian cancer cell line CaOV-3 and to a lesser extent towards the human breast carcinoma cancer MDA-MB-231 cells<sup>3</sup>.

*Eva Jiménez-Medina et. al.*, examined calendula In order to assess the anti-tumor and immunomodulatory effects of *Calendula Officinalis* in vitro, an aqueous extract of the plant was made using a unique extraction technique. Studies on the cell cycle and apoptosis were carried out in cells treated with LACE-14. The LACE extract showed a significant in vitro reduction of tumour cell growth when tested on a variety of human and murine tumour cell lines. There was between 70% and 100% of the inhibition. These results imply that lymphocyte activation and cytotoxic cancer cell activity, two complementary in vitro activities of LACE aqueous extract that may have anti-tumor therapeutic benefits<sup>4</sup>.

*Carolina Lessa Aquino et. al.* experimented Cancers from various causes are frequently treated with the latex of *Euphorbia tirucalli* L. (Aveloz). such as the kidney, lung, prostate, and breast. Furthermore, this latex has been successfully utilised in the treatment of tumours at high concentrations (latex-HDs), though the processes. When we examined the glycolytic metabolism of the two cell types, interesting findings were found that provide evidence that HDs affect the metabolism of cell lines. To fully comprehend the processes underlying this in vitro biological reaction to HDs, more research is required<sup>5</sup>.

*Roger Yazbeck et. al.* investigated, *Murex*, a homoeopathic treatment used to treat a variety of ailments including cancer, is made from marine mollusca in the family Muricidae. This study aimed to evaluate the in vitro bioactivity of the medicine *Murex* against human lymphoma and cancer cells with that of the Australian muricid *Dicathaisorbita* egg mass extracts. Using flow cytometry 16 (propidium iodide and Annexin-V labelling, respectively), necrosis and apoptosis induction were investigated, and cell viability was evaluated using the MTS (tetrazolium salt) colorimetric assay. biological activity in comparison to most examined cell lines. Extracts from orbita eggs significantly decreased the cell viability of most cancer cell lines. Flow cytometry shows that these extracts induce apoptosis in Jurkat cells but cause necrosis in HT29 colorectal cancer cells<sup>6</sup>.

*Moshe Frenkel Et. al.*, The author tested Four extremely diluted treatments (*Carcinosin*, *Phytolacca*, *Conium*, and *Thuja*) were tested against two human breast cancer cell lines (MCF-7 and MDA-MB-231) and two immortalised normal human mammary epithelial cells (HMLE). The treatments caused cell cycle arrest/delay as well as apoptosis in the two breast cancer cell lines with a preference for cytotoxic effects. The results show that these natural compounds have biological activity even when administered in extremely diluted amounts. To investigate the clinical application of these medicines, additional in-depth investigations using different cell lines and animal models are required<sup>7</sup>.

*Sheila Garcia et al.*, The author investigated high dilution of *euphorbia tirucalli*. using the MTT assay, the cytotoxic potential of *Euphorbia 17 tirucalli* 5 lm was evaluated against human breast cancer cells (MCF7). There were several discrepancies between the two sets. However, no direct relationship between physical, chemical, and biological activities could be found<sup>8</sup>.

*Khadla Ayoub Fadlalla et. al.* tested Colon, breast, and prostate cancer cells were evaluated using a methanolic extract of *R. graveolens*. Measurements included viability, cell cycle patterns, clonogenicity, and caspase activation. P53, 53BP1, and -H2AX protein induction and subcellular localizations were studied. *R. graveolens* extract includes bioactive substances that, without the aid of recognised photoactivatable processes, effectively reduce the growth and survival of cancer cells by hitting a number of different targets<sup>9</sup>.

*Shilpi Saha et. al.* , The goal of the research was to identify the precise molecular mechanism(s) driving calcarecarbonica-induced tumour regression as well as to assess the anti-cancer efficacy of the homoeopathic medication. Reverse transcriptase-PCR, flow cytometry, Western blot, and trypan blue dye-exclusion test methods were employed to investigate and characterise the fundamental mechanisms of calcarecarbonica-induced tumour regression. The fact that *Calcare carbonica*-induced apoptosis was inhibited when p53 was knocked out using RNA interference supported the function of p53. These findings highlight the importance of the immuno-modulatory circuit during tumour apoptosis induced by *Calcare carbonica*. The discovered molecular mechanism might provide a framework for incorporating *Calcare carbonica* into immunotherapeutic plans for efficient tumour regression<sup>10</sup>.

*Shagun Arora et. al.*, investigator determined the cytotoxic activity of a few homoeopathic medicines in mother tincture (MT) and ultramolecular dilution (30C, 200C, 1M, and 10M) against cell lines derived from specific organ tumours. *Sarsaparilla* (*Sars*) was tested against human renal adenocarcinoma (ACHN cells), *Ruta graveolens* (*Ruta*) was tested against human colorectal cancer (COLO-205), and *Phytolacca decandra* (*Phyto*) was tested against MCF-7 (human breast carcinoma). In the cultures treated with

homoeopathic medicine, there were evident symptoms of apoptosis, including DNA fragmentation, chromatin condensation, and shrinking of the cells. This study offers preliminary laboratory data demonstrating homoeopathic medicines' capacity as anticancer agents. It is necessary to conduct more research on how these homoeopathic medicines work<sup>16</sup>.

*Shilpi Saha et. Al.* In the current study, the antitumorigenic properties of thuja, a bioactive derivative of the medicinal plant *Thuja occidentalis*, were examined, and the molecular mechanisms underlying thuja's capacity to trigger apoptosis in functional p53-expressing mammary epithelial carcinoma cells were elucidated. Findings demonstrated that thuja 22 effectively caused apoptosis in mammary epithelial carcinoma cells that were functionally p53-expressing<sup>17</sup>.

*Jesmin Mondal et. al.*, The effects of homoeopathic First, the effects of Psorinum 6 on cell viability were evaluated in a variety of cancer cell lines, including A549, HepG2, and MCF-7, using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide test and an ethanol 6-control. Psorinum directly interacted with DNA, as demonstrated by CD spectroscopy using calf thymus-DNA as the target. Psorinum 6 caused A549 cells to undergo apoptosis by up- and down-regulating key signal proteins like p53, caspase-3, Bax, and Bcl-2<sup>18</sup>.

*Faisal Shakeel et. al.*, *E. angustifolia* mother tincture (MT) and homoeopathic dilutions (6C, 30C, 200C, and 1M) were tested for their cytotoxic activity against the human cell lines MDAMB-231 (breast cancer), HeLa (cervical cancer), and PC3 (prostate cancer). Cytotoxicity was evaluated using the 3-(4,5-dimethylthiazolyl-2)-2,5-diphenyltetrazolium bromide (MTT) method. The breast cancer cell line MDA-MB231 can undergo apoptosis when exposed to homoeopathic 24 dilutions of *E. angustifolia*, as demonstrated by this paper, supporting their potential use as adjuvant cancer therapy. *Armin Ghasemi Dizgah et. al.*, Author employed the HEK293, MCF7, and HN5 cell lines. *Theranekron®*, an alcoholic *Tarantula cubensis* extract, was applied to the cells at various doses for various times. Light microscopy was used to observe and study cell morphology. Trypan blue staining was used to measure the mortality rate and the MTT test was used to measure cell growth. The results revealed that cancer cell lines MCF7 and HN5 had much higher levels of toxicity and apoptosis than non-cancerous HEK293 cells<sup>19</sup>.

*Jesmin Mondal et. al.*, tried things out To test for any potential anticancer effects of Hepatitis C 30C (Hep C 30), three cancer cell lines (HepG2; liver cancer), MCF-7 (breast cancer), and A549 (lung cancer) were compared to one normal liver cell line (WRL-68 cells). Furthermore, it changed the mitochondrial membrane's potential, caused phosphatidylserine externalisation, boosted pro-apoptotic signalling proteins like cytochrome c and Bax, and suppressed

anti-apoptotic signalling proteins like caspase-3, cytochrome c, and Bcl-2. According to its anticancer properties, the drug also decreased telomerase and Top II cancer biomarker expression<sup>20</sup>.

*Kirtee Wani et. al.* investigated ,By using the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay, the mother tincture (MT) and other homoeopathic preparations of TC (3X, 6C, and 30C) were evaluated for their impact on the viability of breast cancer (MDAMB231 and MCF7) and non-cancerous (HEK 293) cell lines<sup>21</sup>.

*Ana Catarina Viana Valle et. al.*, tested Breast adenocarcinoma comes in a variety of forms, and PMC-42 and MCF-7 cell lines, which have been used extensively in in vitro research and still largely exhibit the natural phenotypic of the breast, are well-established cell lines. y. As a lower quantity of VAD30 suppresses the growth of this cell line compared to healthy cells, this discovery demonstrates the drug's greater potency of action against tumour cells and its potential for application in cancer therapy<sup>22</sup>.

*Sabiha Khan et. al.*, investigated The cytotoxic effect of the homoeopathic medication *Hydrastis* on hormone-dependent (MCF 7) and hormone-independent (MDA-MB-468) breast cancer cells was assessed using viability and colony-forming assays after 48 or 72 hours of treatment. It was found that the number of G0/G1 cells had grown, and that caspase 3 levels and apoptosis had been triggered. *Hydrastis* may have a selective cytotoxic effect on hormone-dependent breast cancer MCF 7 cells, resulting in cell cycle arrest in the G0/G1 phase, which could account for the induction of apoptosis<sup>23</sup>.

*Nilanjana Basu et. al.*, studied anti-inflammatory properties, *Arnica montana*, a homoeopathic remedy used in traumatic situations, was investigated for its potential as a chemotherapeutic agent against breast cancer. In order to confirm the in silico findings, *Arnica montana* was administered to MCF-7 breast cancer cells in vitro in a controlled experiment. Using flow cytometry, fluorescence microscopy, scratch testing, clonogenic potential, and gene expression analysis, the cytotoxic effects were assessed. Arn MT treatment induced MCF7 cells to undergo apoptosis, according to in vitro studies. Furthermore, Arn MT therapy showed that it might stop cancer cells from migrating and forming colonies<sup>24</sup>.

*Neeladrisingha Das et.al.*, investigated In this research, human breast cancer cell lines were used to assess the anti-proliferative and apoptotic effects of CU extract, which was obtained from its homoeopathic mother tincture. MCF-7 and HEK293 cells' dose- and time-dependent cytotoxicity 30 of the extract was assessed using the MTT test. It was discovered that the extract increased caspasein-dependent necroptosis by engaging MLKL proteins and RIP1/RIP3 kinases. This result was further supported by the use of NEC-1, a necroptosis

inhibitor, which dramatically reduced the necroptotic impact caused by CU extract<sup>29</sup>.

#### IV. CONCLUSION

Homoeopathic medicines have significant therapeutic potential for breast cancer treatment. This review highlights preliminary laboratory evidence that Homoeopathic medicines can be used as anticancer agent. Our findings suggest that high-dilution homoeopathic remedies may interfere with cancer cells apoptosis and cell cycle processes. Based on current research, it appears that carefully chosen homoeopathic remedies have a cytotoxic effect that is more favourable for cancer cells than for normal cells.

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